

gale and seas. 28th, midnight, Florida Reefs, SE. cyclone. 29th, lat. 35° 10' N., long. 74° 50' W., NE. to SW. hurricane, lasting 15 hours; 60 miles S. of Cape Hatteras, NE. hurricane, lasting 10 hours. 31st, Murray's Anchorage, Bermuda, violent NE. gale; lat. 38° 19' N., long. 69° 23' W., heavy NW. gale. JAN. 1st, 1878, lat. 41° 56' N., long. 65° 15' W. and lat. 39° N., long. 40° W., severe SSE. and S. gales. 2nd, lat. 47° 25' N., long. 47° 15' W., strong SW. gale; Straits of Gibraltar, heavy E. gale. 3rd, lat. 45° 53' N., long. 59° 20' W., heavy NW. gale working round to NE. 4th, lat. 42° 05' N., long. 62° 08' W., strong N. gale; lat. 50° 58' N., 40° 39' W., hard NW. gale, lasting 3 hours; lat. 37° 25' N., 67° 20' W., revolving hurricane from NE. to SW.; lat. 37° N., long. 73° W., SE. to NW. hurricane, lasting several hours. 5th, lat. 40° 44' N., long. 68° 28' W., strong S. to W. gale; lat. 31° 17' N., 76° 45' W., heavy WSW. gale; Bermuda Islands, 7 p. m., severe whirlwind, accompanied by torrents of rain; roofs of several houses in Hamilton much injured. 8th, lat. 28° N., long. 72° W., severe W. and NW. gale; off Sable Island, N. gale, lasting several hours. 9th, lat. 47° 36' N., long. 44° 28' W., heavy N. gale; lat. 31° 50' N., long. 74° 54' W., heavy ESE. gale, barometer 29.60; terrific gale off E. coast of Florida. 10th, lat. 37° 44' N., long. 73° 20' W., noon, ENE. gale, by 3:30 p. m., NW. hurricane, barometer 29.15; lat. 38° N., long. 70° W., SE. to N. hurricane, lasting 6 hours; lat. 33° 30' N., long. 75° 10' W., SE. gale, lasting 12 hours, then SW. to NW., terrific hurricane, barometer 29.30; lat. 37° 20' N., long. 74° W., heavy ESE. to N. gale, "hove to 4 hours under bare poles;" lat. 35° 20' N., long. 71° W., hurricane from S. to N., lasting 4 hours; lat. 34° 03' N., long. 75° W., 2 a. m., WSW. almost hurricane, barometer 29.40. 11th, lat. 41° N., long. 67° 20' W., SE. to SW. gale; lat. 34° N., long. 69° W., heavy SE. to SW. gale, lasting 3 days. 12th, lat. 41° 52' N., long. 63° 42' W., strong NW. gale; lat. 33° 22' N., long. 72° 12' W., heavy SE. gale, 14 hours; lat. 35° 47' N., long. 71° 30' W., heavy SE. and SW. gale. 13th, lat. 40° 38' N., long. 68° 52' W., strong WNW. gale. 14th, lat. 55° 05' N., long. 15° 51' W., heavy W. gale. 16th, Fortune Island, Bahamas, severe N. and NNW. gale, lasting from 16th to 19th; lat. 33° 57' N., long. 61° 36' W., tremendous NW. hurricane. 18th, lat. 48° 15' N., long. 43° 40' W., strong W. gale, hard squalls with hail; lat. 49° 59' N., long. 41° 28' W., hard W. gale. 19th, lat. 45° 27' N., long. 47° 37' W., and lat. 48° 12' N., long. 44° 15' W., WNW. gales. 20th, lat. 46° 07' N., long. 50° 15' W., strong NW. winds, with hard hail squalls. 22d, lat. 51° 01' N., long. 19° 59' W., strong WNW. gale. 23rd, lat. 40° 09' N., long. 70° 42' W., heavy NW. gale, barometer 30.65, terrific sea; lat. 50° 48' N., long. 21° 47' W., strong WNW. gale. 24th, lat. 40° 06' N., long. 72° 19' W., heavy NW. gale, with snow; lat. 40° 35' N., long. 72° 33' W., hard W. to WSW. gale. 25th, lat. 41° 31' N., long. 65° 34' W., heavy WNW. gale and snow. 31st, lat. 40° 20' N., long. 72° 40' W., furious E. gale, with heavy snow, lasting 12 hours; lat. 40° N., long. 64° W., heavy NE. gale, with heavy snow, lasting 24 hours.

TEMPERATURE OF THE AIR.

In General.—The general distribution of the temperature of the air is shown by the isotherms on chart No. II. The table of comparative temperatures, in the left-hand corner of same chart, shows the temperature of the month to have been unusually high in the upper Mississippi and upper Missouri valleys and Minnesota, considerably above normal in the lower Missouri valley and Lake region, and about normal along the Atlantic, Gulf and Pacific coasts.

Monthly mean temperatures at special points have been as follows: Bismarck, 17°.5; Breckenridge, 14°.7; Pembina, 11°.2; Mt. Washington, 5°.7; Pike's Peak, 1°.4.

Maximum and minimum temperatures.—*Maximum* temperatures, at Signal Service and volunteer stations, above 70° are reported as follows: 88° at Key West; 82° at Houston, Fla.; 77° at Brownsville; 76° at Castroville, Brackettsville and Eagle Pass; 75° at Baton Rouge Barracks, La., and San Antonio; 74° at Jacksonville, Savannah and Fort Concho, Tex.

Minimum temperatures, at Signal Service and volunteer stations, were —20° at Strafford, Vt.; —21° at Breckenridge; —22° at Sidney Barracks; —23° at Plattsmouth, N. Y., and Neilsville, Wis.; —24° at Fort Garland, Cal.; —25° at Fort Pembina, Dak., and Lunenburg, Vt.; —26° at Pembina, Dak. and Madison Barracks, N. Y.; —27° at Mechanic's Falls, Me.; —28° at Newport, Vt.; —29° at West Waterville, Me.; —30° at Dumbarton and Auburn, N. H.; —32° at Fort Sanders, Wyo. Ter.; —34° at Fort Fred Steele, Wyo. Ter., —35° at Mt. Washington; —36° at Orono, Me.; —38° at Woodstock, Vt.

Ranges of Temperature.—Large monthly and diurnal ranges have been respectively as follows: Visalia, monthly, 45°, daily, 25°; Cheyenne, 67° and 50°; North Platte, 63° and 41°; Fort Griffin, 58 and 44°; Fort McKavitt, 61° and 52°; San Antonio, 52°, 33°; Pembina, 65°, 32°; La Crosse, 53°, 34°; Milwaukee, 58°, 27°; Cleveland, 51°, 32°; Pittsburgh, 58°, 33°; Vicksburg, 47°, 24°; Savannah, 48°, 27°; Washington, 60°, 28°; Burlington and Mt. Washington, 68° and 44°; Winnemucca, 62° and 43°.

Small monthly and diurnal ranges have been as follows: San Francisco, 23° and 12°; Pikes Peak, 35° and 27°; Leavenworth and Denison, 50° and 24°; Galveston, 35° and 22°; Davenport and St. Louis, 49°

and 22°; Grand Haven, 36° and 21°; Erie, 45° and 22°; Key west, 28° and 16°; Charleston, 39° and 21°; Cape Henry, 38° and 22°; Portland, 54° and 32°.

Frosts were reported as follows: California, 1st, 2nd, 3rd, 4th, 5th, 6th, 12th, 13th, 18th, 19th, 20th, 23rd and 30th. Nevada, 1st, 2nd, 3rd, 4th, 5th, 6th, 11th, 12th, 15th, 18th and 26th. Colorado, nearly every day; at Pike's Peak on the 3rd; the first decade was the coldest in the history of the Pike's Peak station. Kansas, 1st, 4th, 5th, 6th, 7th, 8th, 10th, 13th, 14th, 15th, 23rd, 25th and 28th. Indian Territory, 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 14th, 15th, 16th, 17th, 22nd and 23rd. Texas, 1st, 2nd, 4th, 5th, 17th, 14th, 15th, 21st, 22nd, 23rd and 24th; Galveston, 14th, 22nd, 23rd and 24th. Cairo, 1st. Norfolk, 17th. Indianola and Key West, none.

Ice formed on several nights as follows: 2nd, at Visalia; 3rd, $\frac{1}{4}$ inch thick on the Bay of Oakland, Cal.; 3rd and 4th, at Sacramento; 5th, at Vicksburg; 6th, 7th and 16th, St. Marks; 5th and 6th, Mobile; 4th, Keokuk and Escanaba; 5th, Alpena; 12th, Indianapolis; 7th, Knoxville; 1st, Logansport; 6th and 7th, Tybee Island; 2nd, Sandy Hook.

PRECIPITATION.

In General.—The general distribution of rain and melted snow for the month is shown in chart No. III. By reference to the table in the lower left hand corner of this chart it will be seen that the amount of precipitation has been considerably above the normal in the Atlantic coast States and California, and about normal in the East Gulf States and Oregon, while a considerable deficiency occurs in the interior of the country; areas of no precipitation are shown on the chart in northern Missouri and southern Iowa, in western Nebraska, and in Dakota and Montana.

Special Heavy Rains.—3d, Ft. Barrancas, Fla., 2.50 inches. 7th, Santa Cruz, Cal., 1.83 in.; Brownsville, Tex., (6th and 7th) 3.26 in. 8th, Santa Cruz, Cal., 1.46 in. 9th, Mendon, Mass., 2.02 in.; Jacksonville, Fla., (8th and 9th) 2.04 in.; Mayport, Fla., (8th and 9th) 3.72 in.; St. Mary's, Ga., (8th and 9th) 2.20 in.; Daytona, Fla., 4.00. 10th, Smithville, N. C., (9th and 10th) 3.20 in.; Charleston, S. C., (9th and 10th) 2.85 in.; Wilmington, N. C., (9th and 10th) 3.19 in.; Auburn, N. H., 3.12 in.; Lenoir, N. C., (8th to 10th) 3.00 in.; Goldsboro, N. C., (9th and 10th) 2.00 in.; Cape Henry, Va., 2.18 in.; Key West, Fla., (9th and 10th) 3.01 in. 11th, Rochester, N. Y., (10th and 11th) 3.62 in.; New London, Conn., (10th and 11th) 2.00 in.; Boston, Mass., (10th and 11th) 2.67 in.; Waltham, Mass., 4.20 in.; New Haven, Conn., (10th and 11th) 2.53 in.; Thatchers' Island, Mass. (10th and 11th) 2.20 in. 12th, Ft. Sill, Ind. T., 1.68 in. 14th, Mystic, Conn., 1.80 in. 16th, Sacramento, Cal., (15th and 16th) 3.91 in.; Red Bluff, Cal., (14 to 16th) 9.12 in.; Los Angeles, Cal., (14th to 16th) 2.14 in.; 18th, Corsicana, Tex., 1.85. 19th, New Orleans, La., 1.80 in.; Galveston, Tex., (18th and 19th) 1.65 in. 22nd, Sacramento, Cal., 1.34 in. in six hours; Red Bluff, Cal., (21st and 22nd,) 2.98 in. 24th, Daytona, Fla., 3.00 in.; San Francisco, Cal., 1.60 in.; Red Bluff, Cal., 1.81 in. 25th, Santa Cruz, Cal., 2.30 in. 27th, Lebanon, Mo., (26th and 27th,) 2.37 in.; Red Bluff, Cal., 2.92 in. 29th, Fort Barrancas, Fla., (29th and 30th,) 2.40 in.; Baton Rouge Barracks, La., 1.55 in. in two hours. 30th, Montgomery, Ala., 1.91 in.; Daytona, Fla., 3.30 in. 31st, Charleston, S. C., (30th and 31st,) 3.08 in.; Wilmington, N. C., 2.51 in.; Cape May, N. J., 2.09 in.

Large Monthly Rain-falls.—At Red Bluff, Cal., 20.71 in.; Santa Cruz, Cal., 12.06 in.; San Francisco, Cal., 11.97 in.; White Plains, N. Y., 11.10 in.; Olympia, Wash. Ter., 9.82 in.; Cape Hatteras, N. C., 9.43 in.; Waltham, Mass., 9.43 in.; Sacramento, Cal., 9.26 in.; Okahumpka, Fla., 9.25 in.; Cape Lookout, N. C., 9.20 in.; Point Pleasant, La., 8.71 in.; Roseburg, Cal., 8.70 in.; Mt. Washington, N. H., 8.54 in.; Auburn, N. H., 8.30 in.; Rochester, N. Y., 8.05 in.; Fall River, Mass., 7.80 in.; Daytona, Fla., 7.63 in.; Somers, Mass., 7.60 in.; Boston, Mass., 7.60 in.; Trenton, N. J., 7.55 in.; Wilmington, N. C., 7.52 in.; Mill Village, N. H., 7.11 in.; Newport, R. I., 7.06 in.; Eastport, Me., 7.05 in.

Small Monthly Rain-falls.—At Bismarck, D. T., North Platte and Sydney Barracks, Neb., Ames, Iowa, Fort Keogh, Mon., Grant City and Unionville, Mo., none; Colorado Springs, Col., 0.02 in.; Fort McPherson, Neb. and Fort Griffin, Tex., 0.04 in.; Fort Pembina, D. T., Hopkins, Mo., Concho and McKavett, Tex., 0.05 in.; Phoenix and Florence, A. Ter. and Breckenridge, Minn., 0.06 in.; Cheyenne, Wyo. Ter., 0.08 in. Denver, Col. and Olivet, D. T., 0.10 in.; Norfolk, Neb., Pembina, D. T. and Fort Sanders, Wyo. Ter. 0.12 in.

Floods and High Tides.—11th. Freshets along the Staunton and Roanoke rivers; bridges carried away. California, 16th, Los Angeles and Red Bluff, railroad bridges washed away and much damage done throughout the country. At San Buenaventura, Santa Barbara and More's Landing, wharves were carried away. Santa Cruz, Cal., 25th, San Lovenza river rose five feet, surf higher than for six years; a heavy W. sea-swell occurred along the California coast. 31st. High tides along the Atlantic seaboard, doing considerable damage on the New Jersey and Long Island coasts. Sandusky, Ohio, water in bay rose three feet during high north-east winds; at Kelly's Island, the water rose higher than for eleven years, the bank protection being badly washed away.